

Sub H¹² mutually parallel directing elements in the first row intersects a tip of a respective one of the k mutually parallel directing elements of the second row, and a respective line tangent to n of the k mutually parallel directing elements in the second row intersects a respective one of the n mutually parallel directing elements in the first row.

REMARKS

Claims 1-2, 4-5, 7, 9-18 and 21-22 are currently pending. Claims 1-2, 4-5, 7, 9-18, and 21-22 have been rejected. Claims 1, 21, and 22 have been amended. A marked up version of the claims are included in Appendix A. New claims 23-25 have been added. Support for the new claims can be found throughout the specification, for example on page 7, lines 8-30 and in FIG. 4. No new matter has been added by way of this amendment.

Applicants thank the Examiner for the indication that claims 1-2, 4-5, 7 9-18 and 21-22 would be allowable if rewritten or amended to overcome the rejections under 35 U.S.C. 112, second paragraph, as well as for discussing possible alternative claim language to resolve the issue related to the 35 U.S.C. 112 rejection.

Objection to the Specification

The Examiner has objected to the Specification as containing a reference to the claims 1 and 13. Applicants have amended the Specification, to remove the reference to claims 1 and 13. Applicants respectfully submit that the amendment addresses the issue raised by the Examiner and submit that the objection has been rendered moot.

Rejection under 35 USC §112

Claims 1-2, 4-5, 7 and 9-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite. More specifically, the Advisory Action maintains the 35 U.S.C. 112 rejection from the Final Office Action dated March 25, 2003. In the Final Office Action, the Examiner states, "Regarding claim 1, the recitation of 'a line describing a longitudinal edge of each directing element in the first row is substantially tangent to a tip of each directing element in the second row' is indefinite." The Examiner indicates that the number of directing elements in the first row 17 is greater than the number of directing elements in the second row 18.

Applicants have amended Claims 1, 21, and 22 to further clarify the relationship between mutually parallel directing elements in the first and second rows. Specifically, Applicants have amended independent claim 1 to recite, "wherein for a plurality of the mutually parallel directing elements in at least one of the first row and the second row, a line tangent to the elongated edge of the directing element intersects a tip of a directing element in the other of the first and second rows." Claims 21 and 22 have been similarly amended. Accordingly, Applicants submit that the amendments to independent claims 1, 21, and 22, address the issue raised by the Examiner's rejection under 35 U.S.C. § 112 regarding claims 1-2, 4-5, 7, 9-18, and 21-22 and therefore respectfully request withdrawal of the Examiner's rejection on this ground.

CONCLUSION

In view of the above amendments and remarks, Applicant respectfully submits that the application is in condition for allowance. Reconsideration and withdrawal of the Examiner's rejections is respectfully requested and allowance of all pending claims is also respectfully requested.

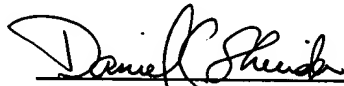
If any outstanding issues remain, or if the Examiner has any suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number below.

Respectfully submitted,

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Dated: June 25, 2003

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APPENDIX A

(Version With Markings To Show Changes Made In The Claims)

IN THE SPECIFICATION

Please Amend the paragraph in the Specification on page 4, beginning on line 20 as follows:

These and other objects, which will appear from the description below, have now completely or partially been achieved by means of a fluid conveying tube and a vehicle cooler according to the appended claims [1 and 13, respectively]. Preferred embodiments are defined in the dependent claims.

IN THE CLAIMS

Please amend Claims 1, 21, and 22 as follows:

1. (Four Times Amended) A fluid conveying tube for vehicle coolers, which on its interior comprises:

first and second opposing longitudinal primary heat-exchange surfaces, said surfaces having flow-directing surface structures;

each surface structure extending laterally across said primary surfaces, each surface structure comprising at least one row of elongate directing elements, said elongate directing elements being arranged obliquely with respect to the longitudinal direction of the primary surfaces, said elongate directing elements in each row being mutually parallel;

said surface structures being alternatingly arranged in the longitudinal direction on the first and second primary surfaces, the directing elements in each laterally extending row of each surface structure being substantially parallel to the directing elements in the succeeding row of the succeeding surface structure on the opposing primary surface in the longitudinal direction of the tube;

said surface structure further comprising a laterally extending second row of mutually parallel directing elements, the directing elements of the second row being arranged at an angle (γ) relative to the directing elements of the first row;

wherein [a line describing a longitudinal edge of each directing element in the first row is substantially tangent to a tip of each directing element in the second row] for a plurality of the mutually parallel directing elements in at least one of the first row and the second row, a line tangent to the elongated edge of the directing element intersects a tip of a directing element in the other of the first and second rows.

21. (Twice Amended) Means for effecting heat transfer in a heat exchanger, comprising:

means for introducing a plurality of partial flows into a heat exchanger tube, the tube defining a longitudinal axis and

means for imparting to each of said partial flows a swirling motion about the longitudinal axis, wherein said means for imparting said swirling motion comprises elongated directing elements on said surfaces of said tube, said elongated directing elements are situated substantially parallel in a first row and a second row substantially parallel, [wherein a line describing a longitudinal edge of each directing element in the first row is substantially tangent to a tip of each directing element in the second row] for a plurality of the mutually parallel directing elements in at least one of the first row and the second row, a line tangent to the elongated edge of the directing element intersects a tip of a directing element in the other of the first and second rows.

22. (Twice Amended) A method of effecting heat transfer in a heat exchanger, comprising:

introducing a plurality of partial flows into a heat exchanger tube with first and second opposing longitudinal primary heat-exchange surfaces, the tube defining a longitudinal axis and

imparting to each of said partial flows a swirling motion about the longitudinal axis through elongated directing elements situated in a first row and a second row substantially parallel, wherein [a line describing a longitudinal edge of each directing element in the first row is substantially tangent to a tip of each directing element in the second row] for a plurality of the mutually parallel directing elements in at least one of the first row and the second row, a line tangent to the elongated edge of the directing element intersects a tip of a directing element in the other of the first and second rows.